



Model Assisted Ration Tailoring & Scheduling (MARTS) Program

General Description:

This model, funded through the DoD Food Nutrition Research & Engineering Program, will work in unison with the Integrated Unit Simulation System force-on-force model to assess the effects of rations on battlefield outcomes.

Objectives:

Develop models representing the effects of hydration, nutrition and physical fatigue for incorporation into larger force-on-force simulations of dismounted infantry operations. These simulations will be employed to support research and development in the areas of warfighter logistics, nutrition and other performance enhancers as dictated by the precepts of the DoD Simulation Based Acquisition policy.



Facts:

- The Integrated Unit Simulation System (IUSS) currently calculates the physiological response to soldiers stressed by heavy loads; rapid movement; restrictive personal protection; hot, humid climates; rehydration; and work / rest regimes.
- MARTS enhances the current IUSS capability to track metabolic workload to relate rate expenditure from different "Energy Stores" to time histories of task metabolic workload demands. This effort resulted in the development of the Dynamic Nutrition Model (DYNUMO).
- Completed work efforts include correlation of physiological/psychological stressors as they affect performance of selected battlefield tasks, development of a 1st generation model/analysis to demonstrate the effects of nutritional supplements and ration scheduling on performance, and development of appropriate operational vignettes to support longer term missions.
- Current efforts include combining the Ration Selection Program (RaSP) and DYNUMO into the Model Assisted Ration Tailoring & Scheduling Program (MARTS) and integrating MARTS into the IUSS to dynamically track nutrient intake and energy expenditure in select battlefield tasks.
- This work will facilitate development and testing of nutritional supplements and other products designed to tailor rations to specific mission task requirements by supporting experimental design, focusing data collection efforts, extrapolating test results to a wider range of operational conditions and demands, and demonstrating the incremental differences in hydration and/or nutrition on mission effectiveness/completion.
- NSC is working with USARIEM to leverage their hyperthermia/hypothermia and energy expenditure data for use in calculating fatigue.
- In FY02 DYNUMO became capable of simulating the response of metabolic fuel status (metabolic fuel levels and rates of utilization) to submaximal, steady-state exercise, with and without glucose ingestion. Future versions of DYNUMO will extend this capability to include simulation of extended duration (several days) scenarios, ingestion of other foods (fats and proteins), and will include a variety of militarily relevant physical activities.
- In FY03 the completed model will be demonstrated through analysis and verified & validated code delivered to the customer.

Point of Contact:

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